



U.S. Food and Drug Administration

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# Peripheral T-cell Lymphomas

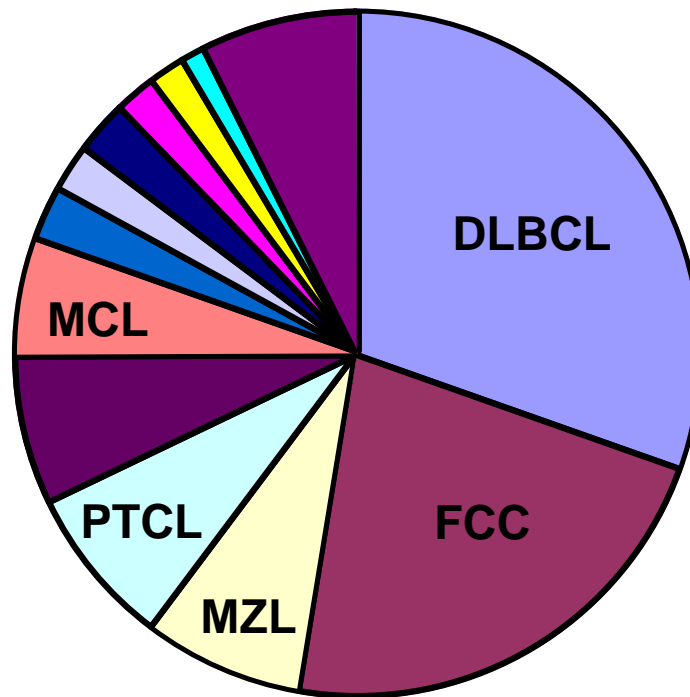
Wyndham H. Wilson, MD, PhD

**Bethesda, Maryland**



# Distribution of Non-Hodgkin's Lymphomas

T-cell Lymphomas  $\cong$  10-15% of Total Cases



■ Diffuse Large B-cell

■ Follicular Lymphoma

■ Marginal zone B-cell lymphoma, MALT

■ Peripheral T-cell lymphomas

■ CLL/SLL

■ Mantle Cell Lymphoma

■ Mediastinal Large B-cell Lymphoma

■ Anaplastic Large Cell Lymphoma/T-null

# WHO Classification

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Peripheral T-cell lymphoma, US

Angioimmunoblastic T-cell lymphoma

Adult T-cell leukemia/lymphoma (HTLV-1+)

Anaplastic large cell lymphoma (T & null cell)

Extranodal NK/T-cell lymphoma, nasal type

Enteropathy-type T-cell lymphoma

Subcutaneous panniculitis-like T-cell lymphoma

Mycosis fungoides/ Sezary syndrome

Primary cutaneous CD30+ T-cell LPD

T-cell prolymphocytic leukemia

T-cell large granular lymphocytic leukemia

Aggressive NK-cell leukemia

Hepatosplenic T-cell lymphoma ( $\gamma\delta$ )

Nodal

Extra-Nodal

Cutaneous

Leukemic/ BM

# Peripheral T & NK Cell Neoplasms

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- Infrequent Compared to B-cell Lymphomas
- Molecular pathogenesis unknown for most subtypes
- Most subtypes clinically aggressive and cytological grade is generally not useful
- No standard or curative treatments for most subtypes

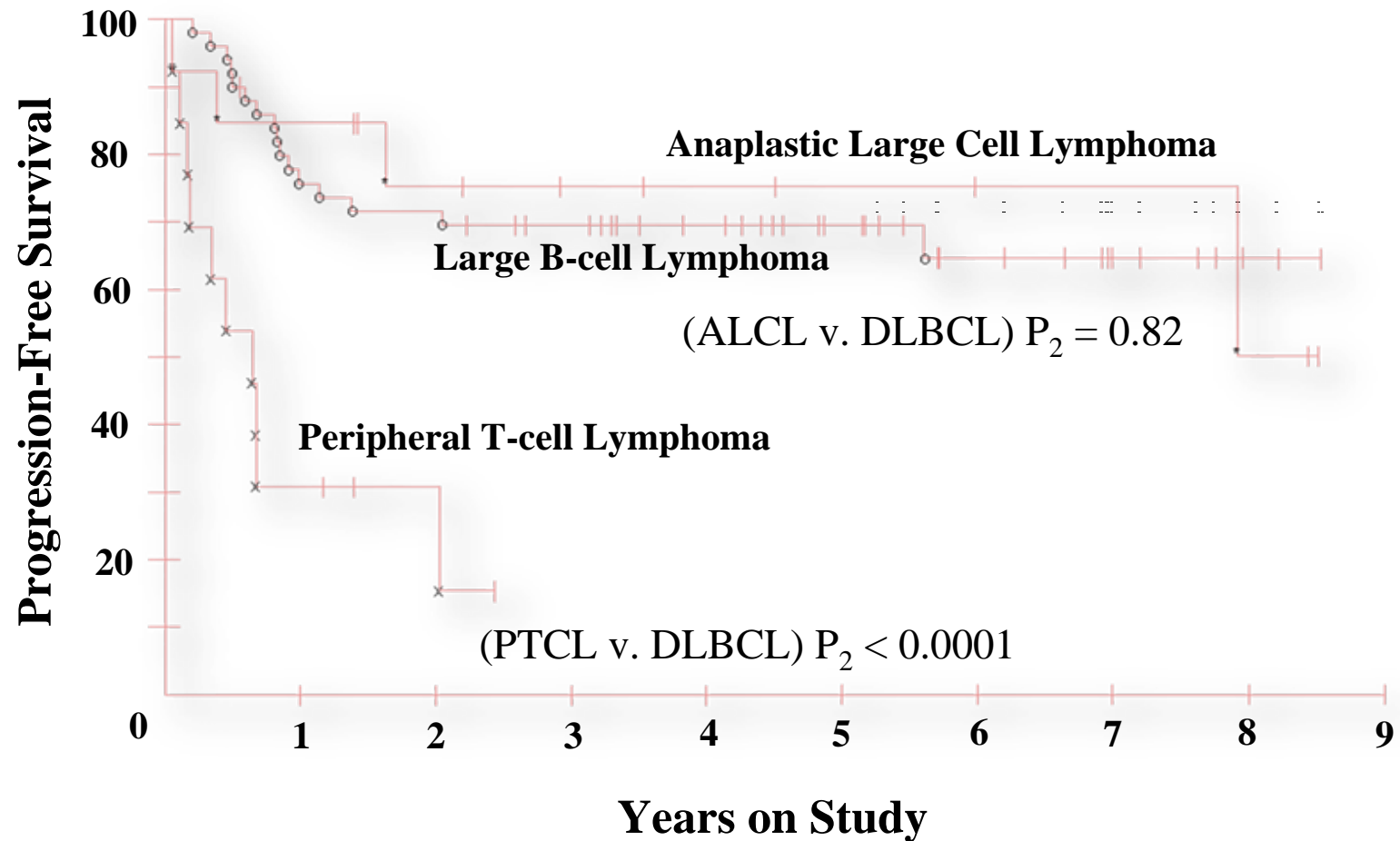
# Clinical Features of Peripheral T-cell Lymphomas

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Generalized lymphadenopathy	50-75%
Skin Involvement	20-50%
Hepatosplenomegaly	25-20%
Liver involvement	10-25%
Bone marrow involvement	25-35%
Hypergammaglobulinemia	25-50%
Stage III/ IV	75%
“B” Symptoms	50-60%

(Based on series from NCI, Nebraska, & Nagoya, Japan)

# Initial Doxorubicin-Based Treatment



# International T-cell NHL Study

## Sites (N = 1314)

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- **North America**

- Vancouver, Bethesda (NCI), Nebraska, Massachusetts (MGH), California (USC), Arizona

- **Europe**

- Barcelona, Norway, Wurzburg, London, Lyon, Leeds, Madrid, Bologna, Modena

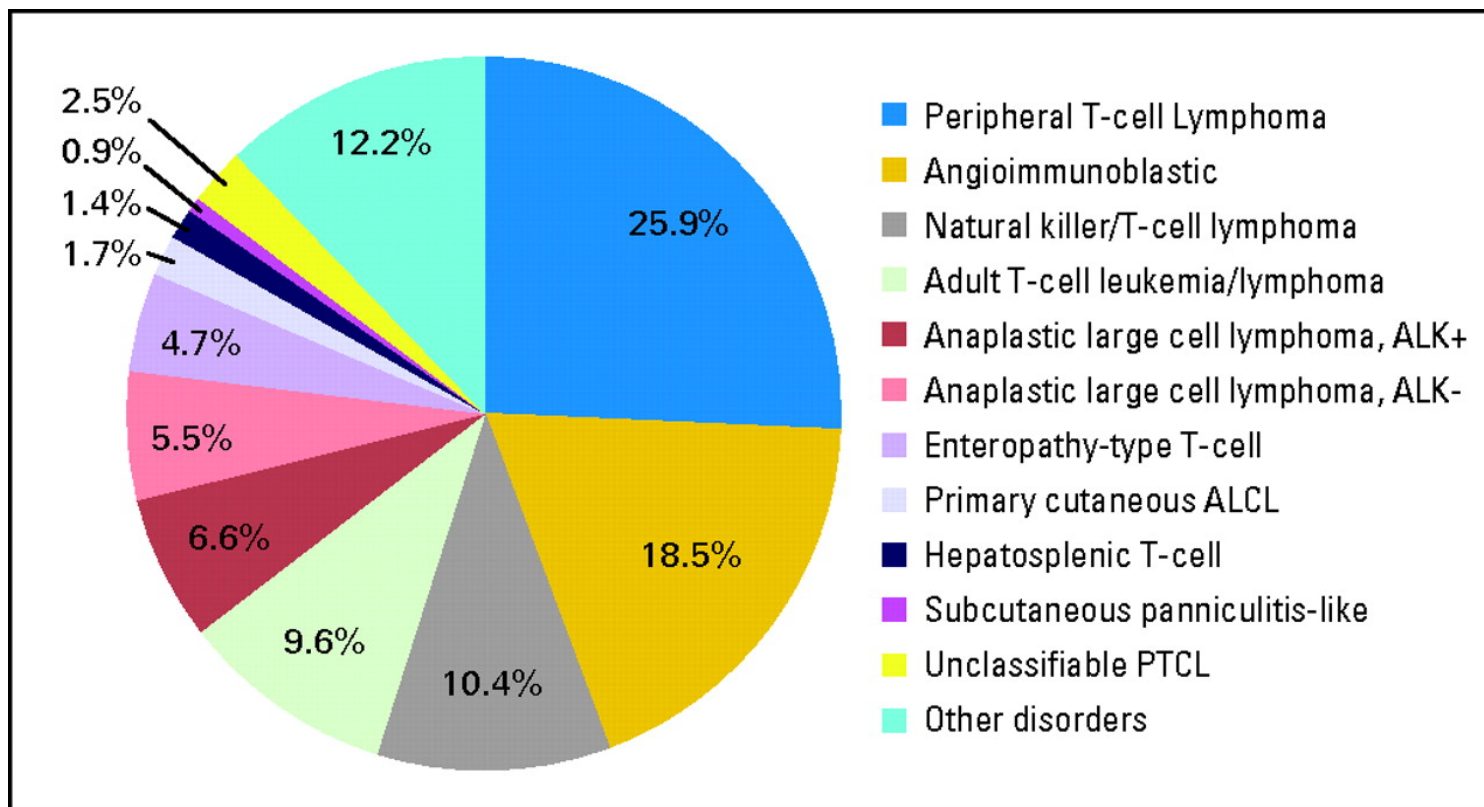
- **Asia**

- Bangkok, Hong Kong, Singapore, Tokyo, Nagoya, Okayama, Fukuoka, Seoul

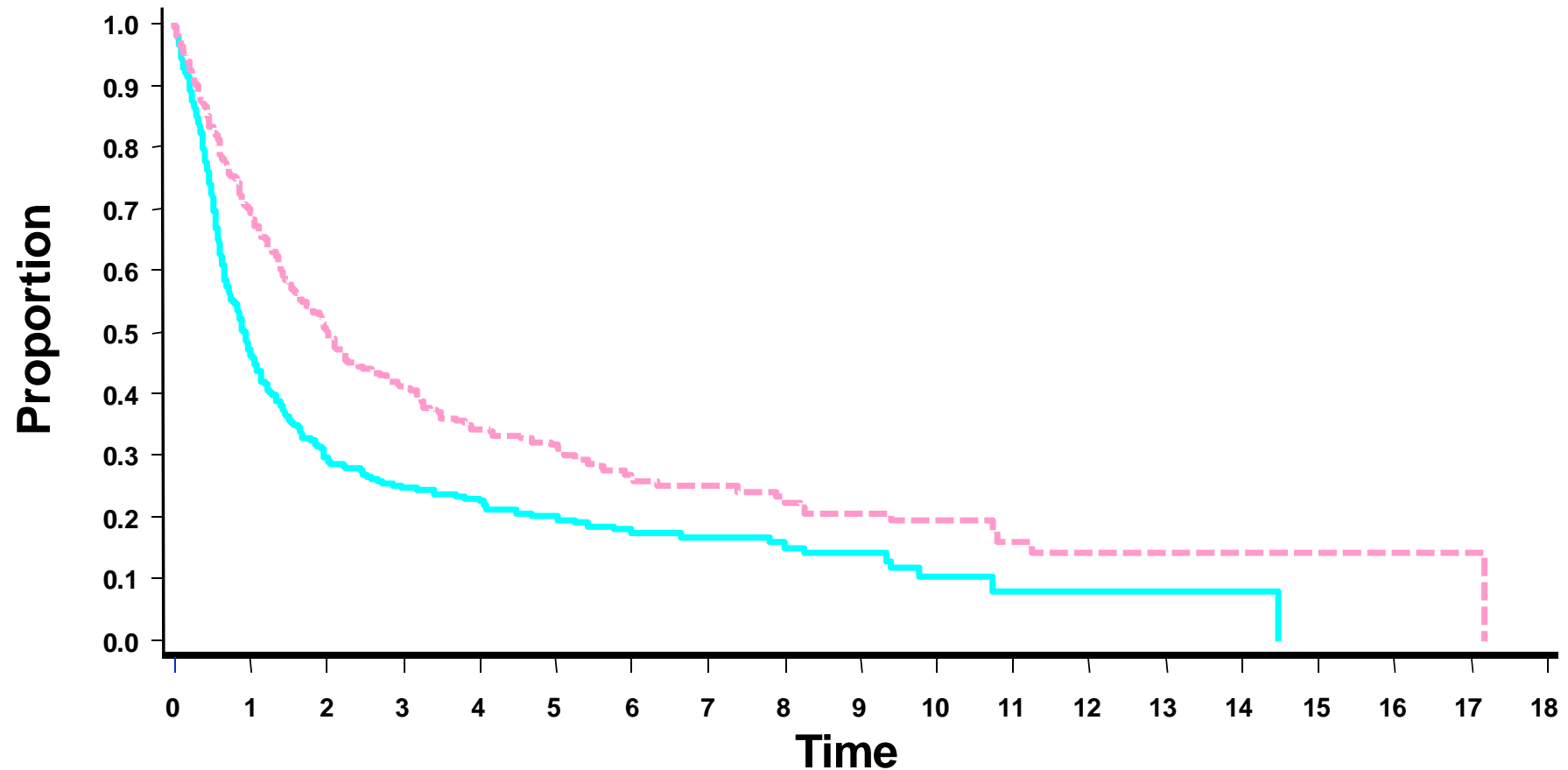


# International T-Cell Lymphoma Project

Distribution of 1,314 cases by consensus diagnosis



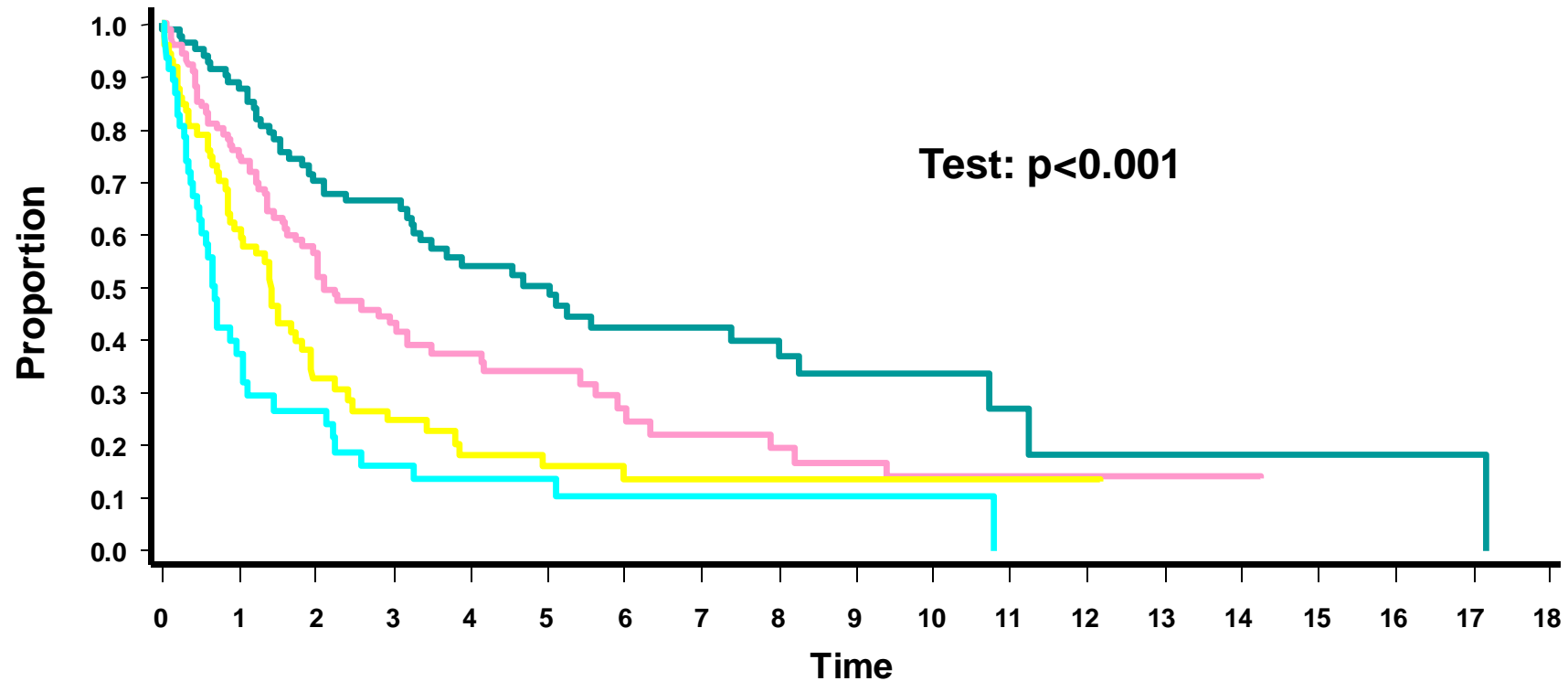
# Peripheral T-Cell Lymphomas (NOS)



	CENSOR	FAIL	TOTAL	MEDIAN
FFS	72	261	333	0.91
OAS	112	221	333	2.01

# Peripheral T-Cell Lymphomas (NOS)

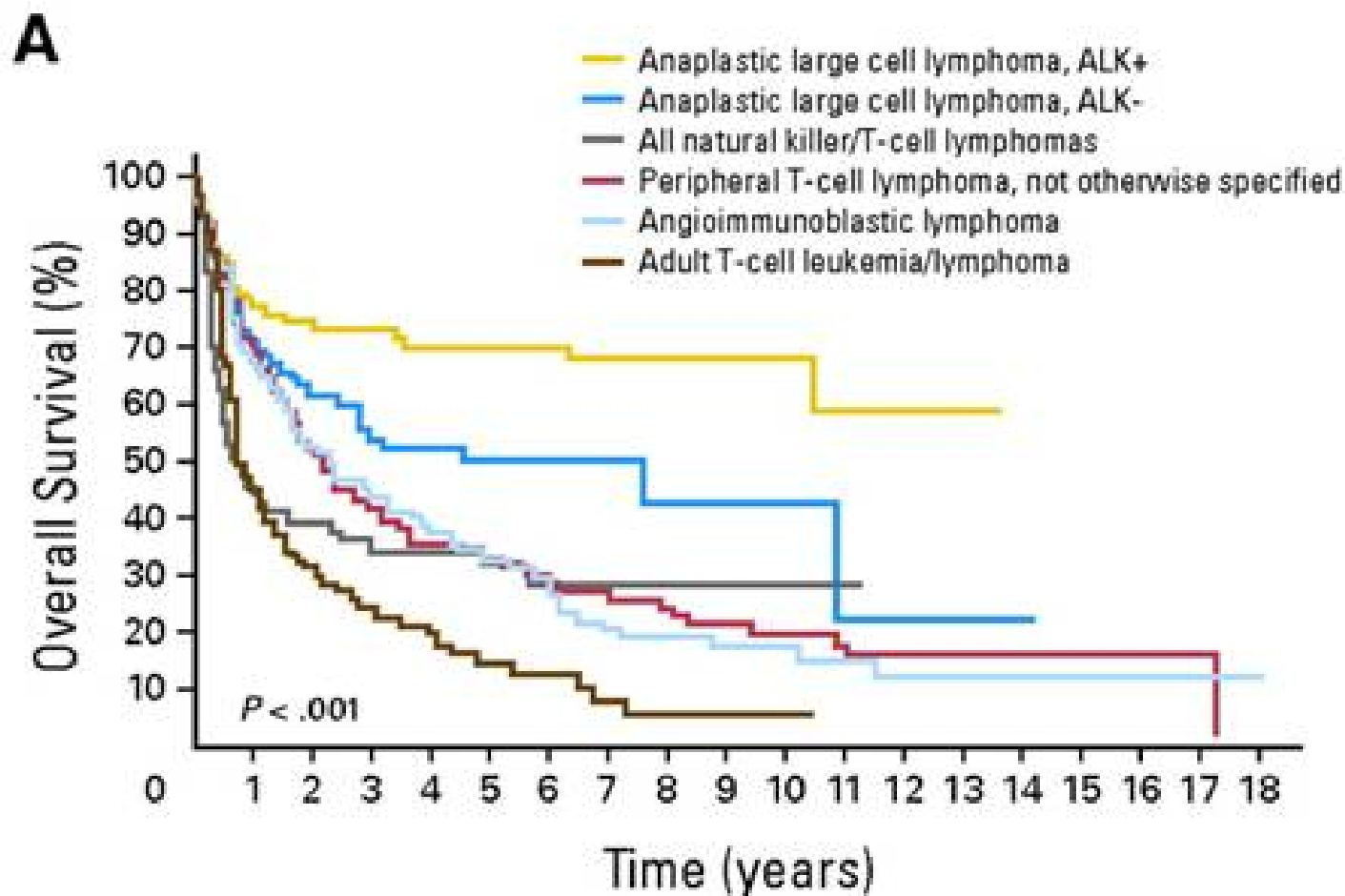
## Survival By International Prognostic Index



IPI		CENSOR	FAIL	TOTAL	MEDIAN
0/1	<div></div>	36	47	83	5.03
2	<div></div>	36	67	103	2.1
3	<div></div>	20	53	73	1.41
4/5	<div></div>	9	38	47	0.68

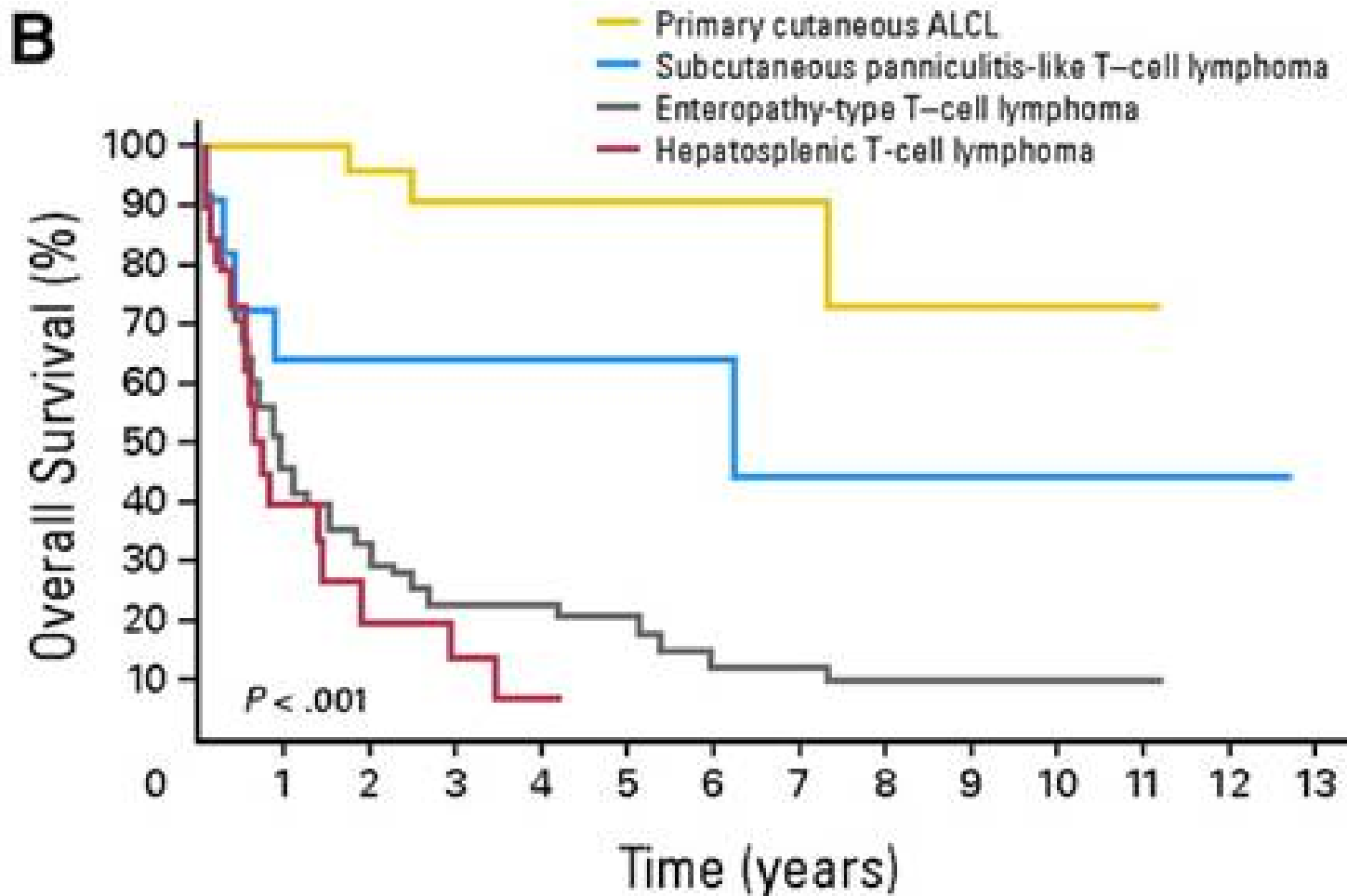
# International T-Cell Lymphoma Project

## Survival By Subtype of PTCL



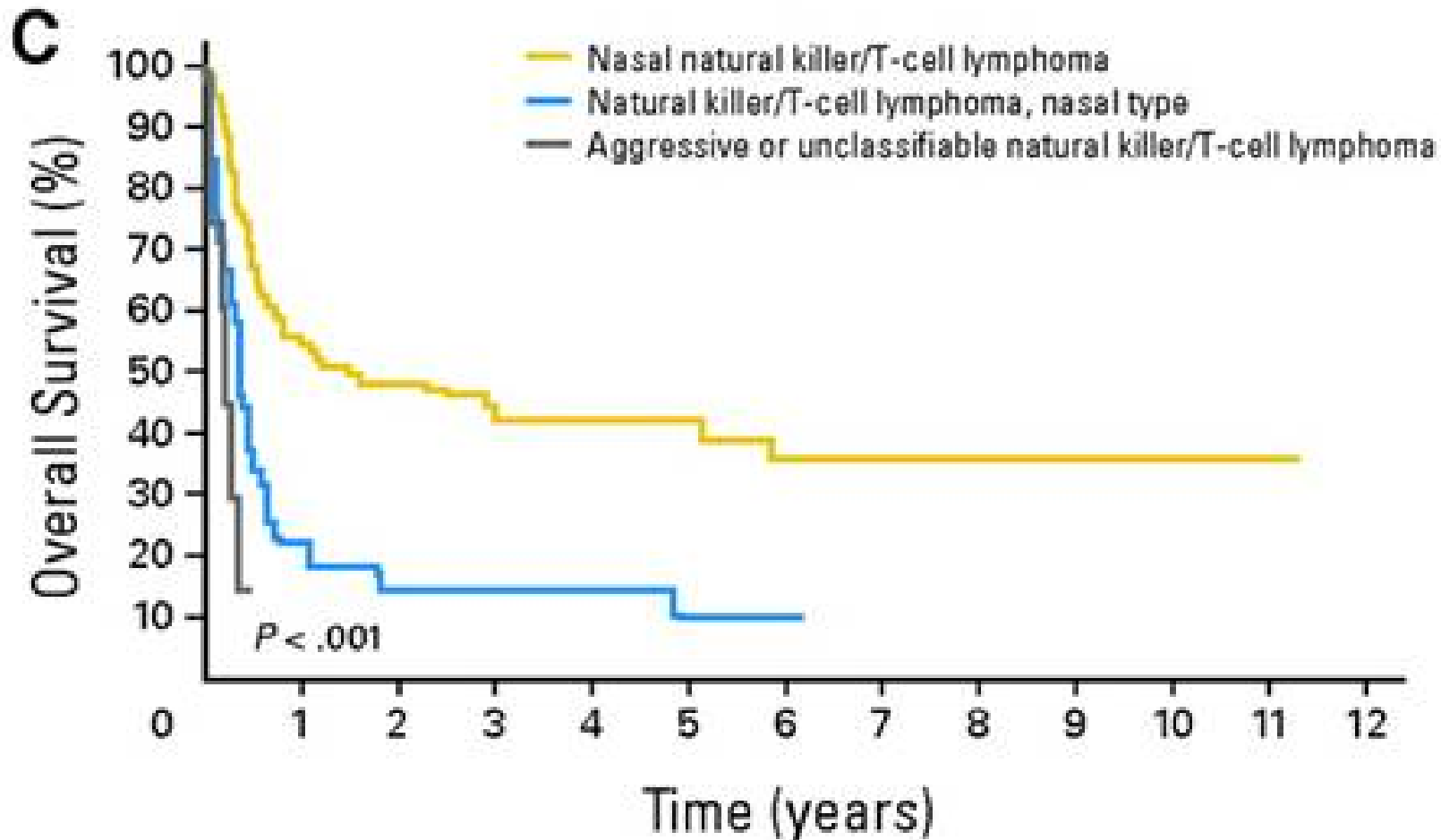
# International T-Cell Lymphoma Project

## Survival By Subtype of PTCL



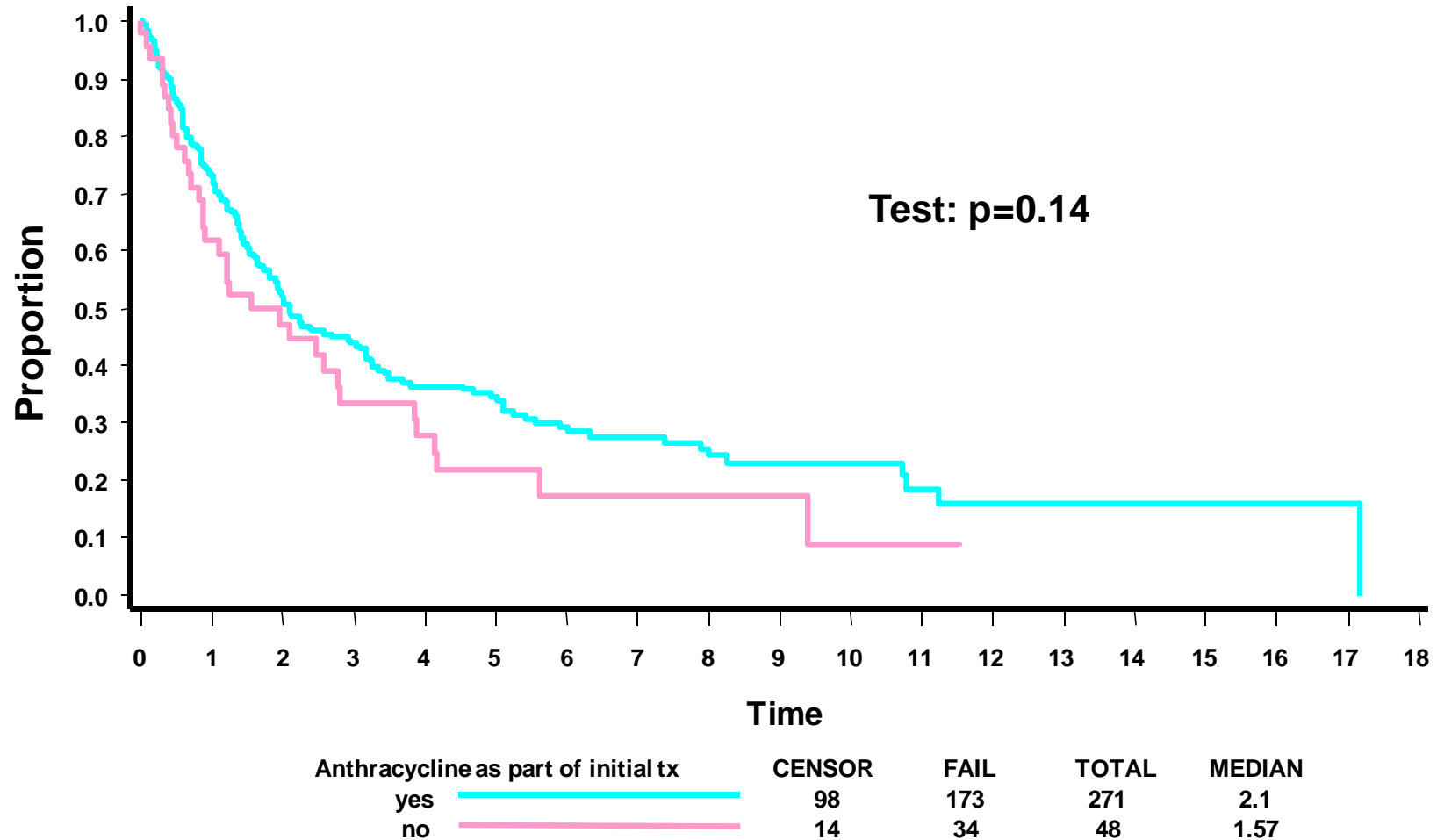
# International T-Cell Lymphoma Project

## Survival By Subtype of PTCL



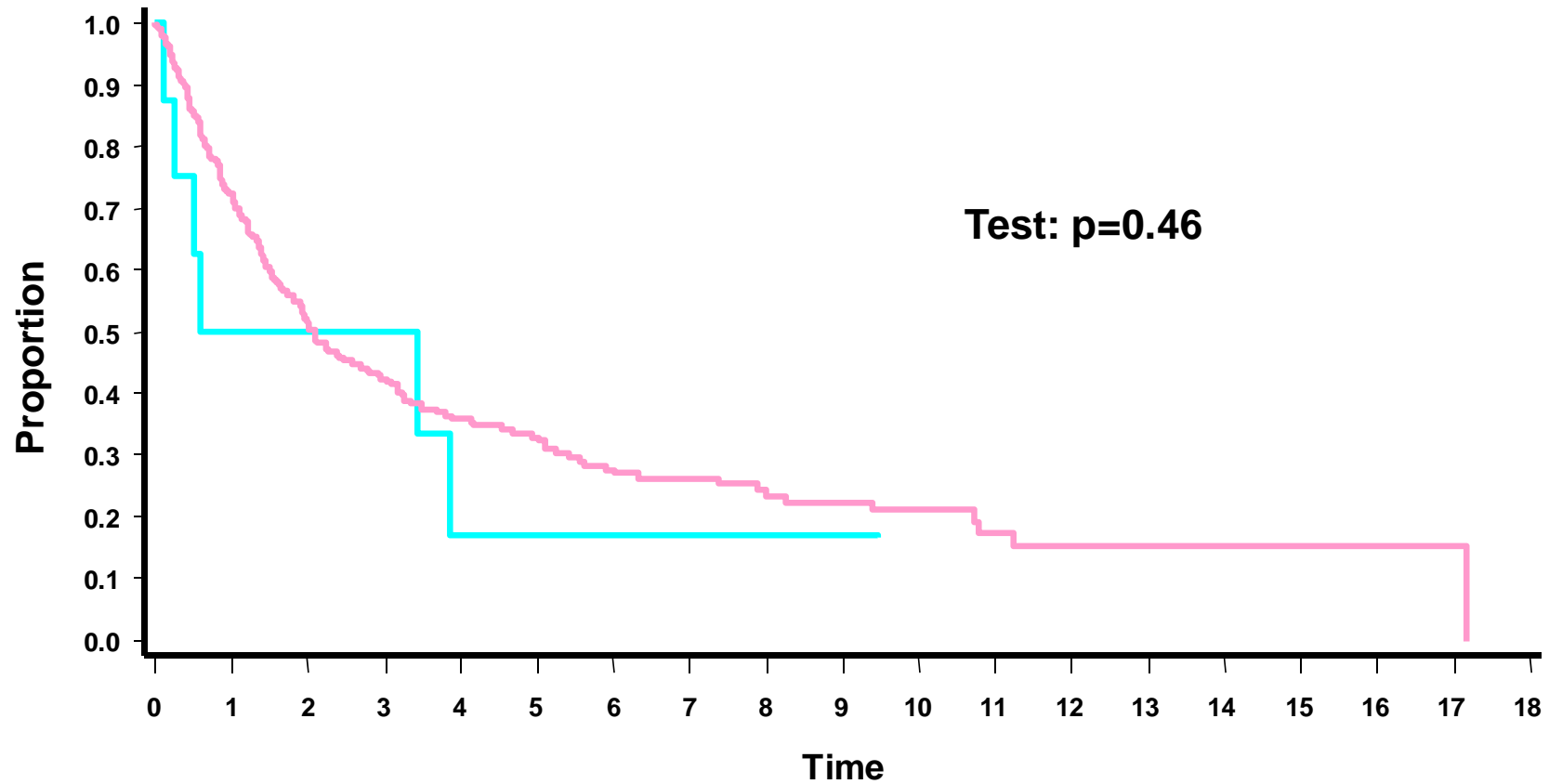
# International T-Cell Lymphoma Project

## Survival By Initial Anthracycline Use



# International T-Cell Lymphoma Project

## Survival By Initial Platinum Use

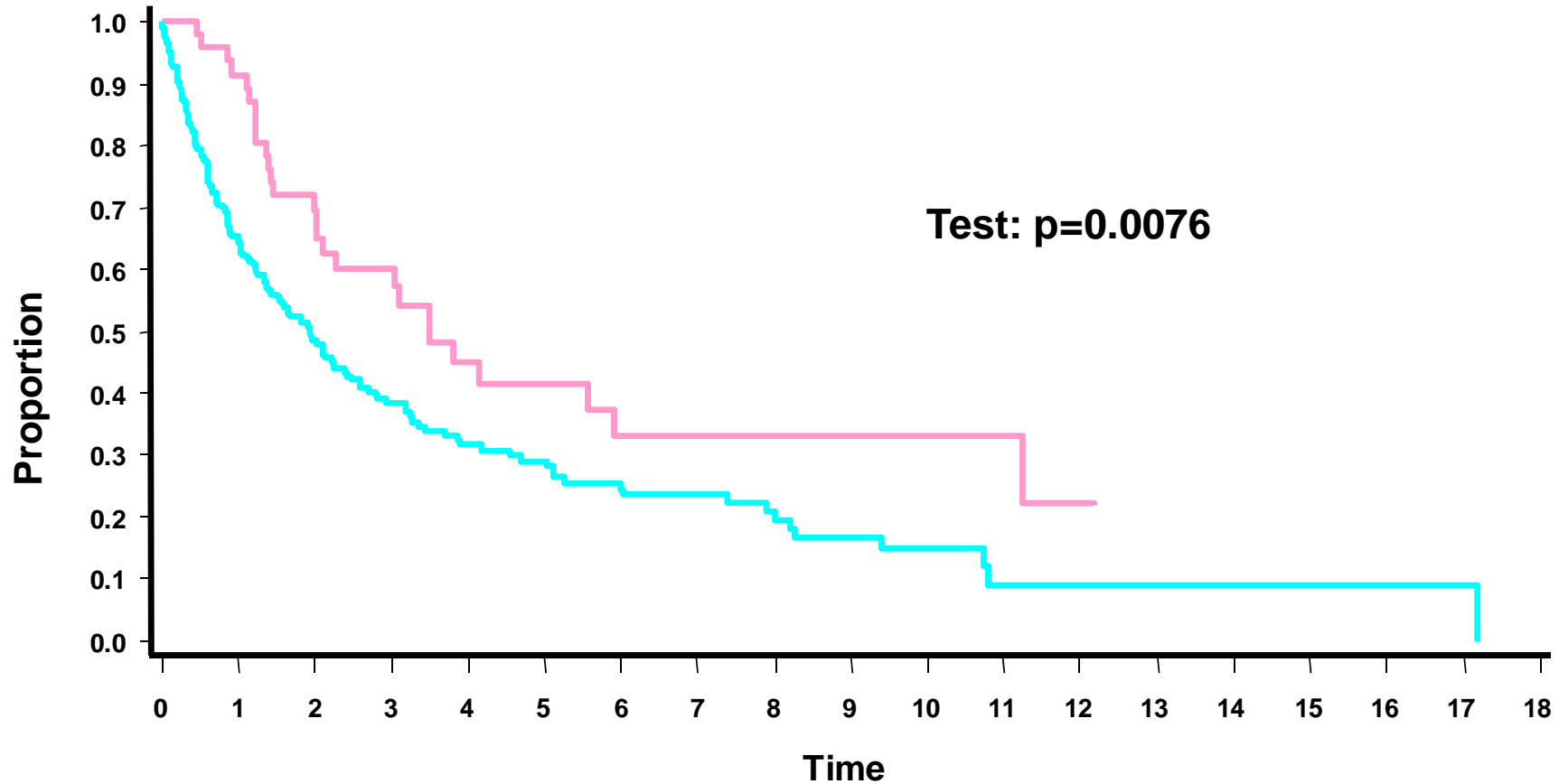


Carbo/Cisplatin as part of initial tx	CENSOR	FAIL	TOTAL	MEDIAN
yes	2	6	8	2.01
no	110	200	310	2.1



# International T-Cell Lymphoma Project

## Survival By High Dose Treatment (SCT)



Hi-dose therapy (transplant)

yes

no

CENSOR

21

63

FAIL

27

148

TOTAL

48

211

MEDIAN

3.5

1.95

# Conclusion

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- Peripheral T-cell lymphomas are infrequent
- Need for better molecular understanding
- Most are incurable so there is a need for new agents

- Return to Main

# **FDA Review of NDA**

**Folotyn™ (Pralatrexate)**

**ODAC September 2, 2009**

**Shakun Malik, MD**

# NDA 22-468 Review Team

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## **DDMAC**

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## **Project Manager**

Milinda Vialpando

# NDA 022-468

## **Proposed indication:**

- Pralatrexate as a single agent for the treatment of patients with relapsed or refractory peripheral T-cell lymphoma (PTCL)

## **Basis for the application:**

- Overall Response Rate (ORR) from one single arm pivotal trial (PDX-008)

# Outline of Presentation

- Background Information
- Key regulatory history milestones
- Pivotal trial PDX-008
- Major Issues
- FDA review results
  - Efficacy
  - Safety
- Question to ODAC

# Pralatrexate

Pralatrexate is a New Molecular Entity (NME) and is a structural analogue of the anti-folate drug methotrexate.



# PTCL

- PTCL prevalence is approximately 10-15% of all newly diagnosed NHL.
- The current annual prevalence of PTCL in the U.S. is estimated to be approximately 9,500 patients.

# Mature T-cell and NK-cell Neoplasms

## WHO Classification (2008)

### Cutaneous

- Mycosis fungoides
- Sezary syndrome
- Primary cutaneous CD30+ T-cell LPDs
- Primary cutaneous anaplastic LC lymphoma
- Primary cutaneous  $\gamma\delta$  T-cell lymphoma
- Primary cutaneous CD8+ aggressive epidermotropic lymphoma\*
- Primary cutaneous CD4+ small/med T-cell lymphoma\*

### Leukemic

- T-cell prolymphocytic leukemia
- T-cell large granular lymphocytic leukemia
- Adult T-cell leukemia/lymphoma

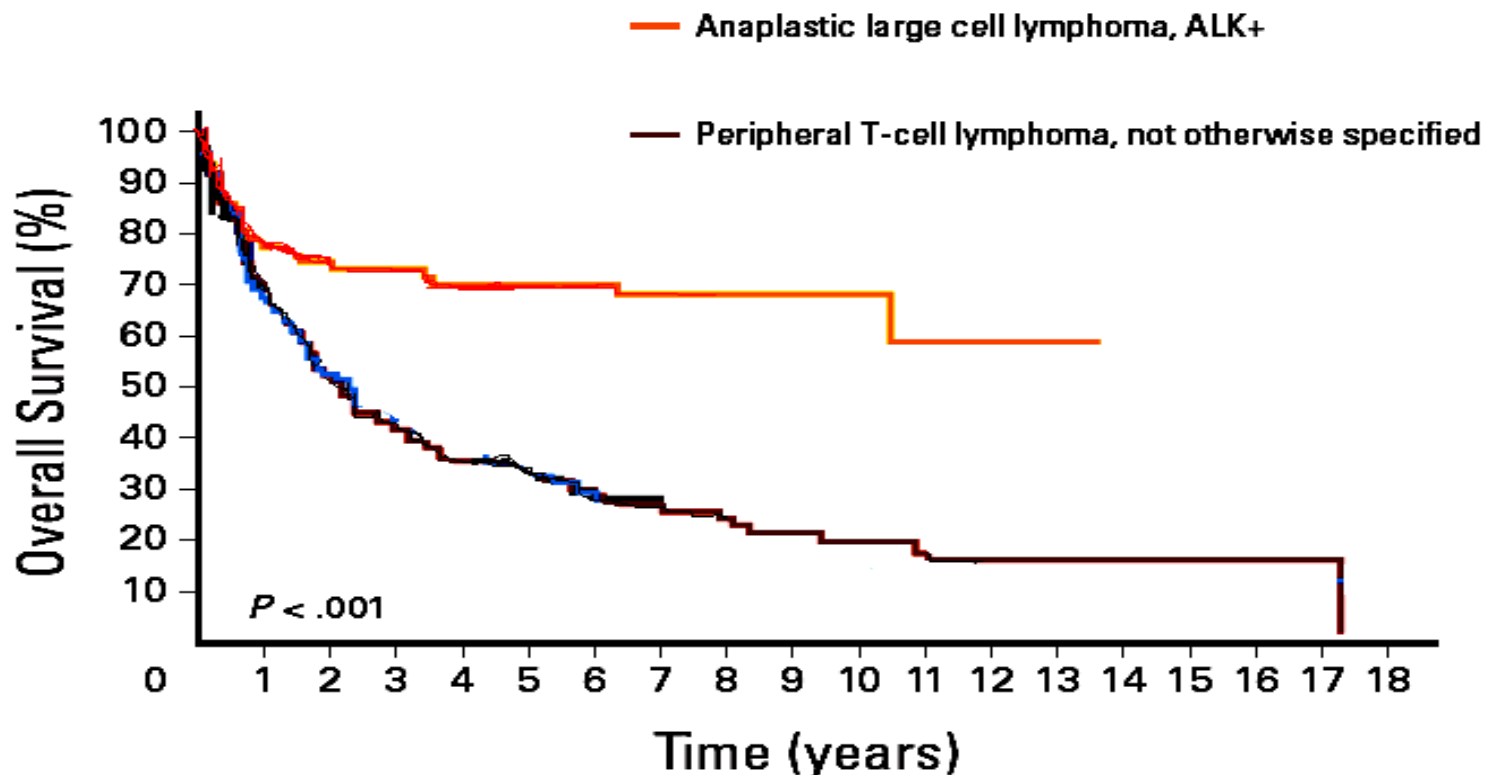
### Nodal

- Angioimmunoblastic T-cell lymphoma
- Anaplastic large-cell lymphoma, ALK pos
- Anaplastic large-cell lymphoma, ALK neg\*
- Peripheral T-cell lymphoma, NOS

### Extranodal

- Systemic EBV+ T-cell childhood LPD\*
- Hydroa vaccineforme-like lymphoma\*
- Extranodal NK/T-cell lymphoma, nasal type
- Enteropathy-associated T-cell lymphoma
- Hepatosplenic T-cell lymphoma
- Subcutaneous panniculitis-like T-cell lymphoma

## Overall Survival by PTCL Subtypes



# PTCL Treatment

- Currently there are no therapies specifically approved for the treatment of PTCL.
- Randomized trials are lacking.
- Most published series are difficult to interpret partly because of the inclusion of heterogeneous subtypes.

Mechanism	Agent (Reference)	N	ORR (CR) %	Response Duration
Immunotherapy	Denileukin diftitox <sup>17</sup>	27	48 (22)	6 mo
	Denileukin diftitox + CHOP <sup>18*</sup>	31	90 (71)	13 mo
	Alemtuzumab <sup>21</sup>	14	36 (21)	2–12 mo
	Alemtuzumab (reduced dose) <sup>22</sup>	10	60 (20)	7 mo
	Alemtuzumab + CHOP <sup>23*</sup>	24	75 (71)	11 mo
	Zanolimumab <sup>27</sup>	21	24 (9)	1–8 mo
	Siplizumab <sup>28</sup>	9	11 (11)	NR
Antimetabolite	Gemcitabine <sup>31</sup>	13	69 (8)	NR
	Gemcitabine <sup>39</sup>	10	60 (20)	13 mo
	Pentostatin <sup>32</sup>	5	80 (40)	4 mo
	Pralatrexate <sup>33</sup>	16	62 (56)	NR
HDAC	Romidepsin <sup>39</sup>	19	26 (10)	8–14 mo
	Belinostat <sup>40</sup>	11	18 (9)	3–4 mo
AITL-specific	Cyclosporine <sup>42</sup>	12	67 (25)	2–120 mo
	Rituximab + CHOP <sup>53*</sup>	9	89 (89)	7–53 mo
nNK/T-specific	Asparaginase <sup>57</sup>	33	51 (51)	55% OS at 5 y
ALCL-specific	SGN-30 <sup>58</sup>	39	20 (5)	1–12 mo
	MDX-060 <sup>59</sup>	7	28 (28)	2–24 mo

\*Frontline therapy. All other studies in relapsed/refractory. Response duration listed as median if available or range.  
Abbreviations: AITL, angioimmunoblastic T-cell lymphoma; ALCL, anaplastic large-cell lymphoma; CHOP, cyclophosphamide, doxorubicin, vincristine, prednisone; CR, complete response rate; HDAC, histone deacetylase; nNK/T, natural killer/T-cell lymphoma; NR, not reported; ORR, overall response rate; OS, overall survival.

# **PDX-008 (PROPEL) Study**

**A Multi-center, Phase 2, Open-label Study of  
(RS)-10-Propargyl-10-Deazaaminopterin  
(Pralatrexate) with Vitamin B12 and Folic Acid  
Supplementation in Patients with Relapsed or  
Refractory Peripheral T-cell Lymphoma**

# Main Concerns with this NDA

- Duration of Response
  - ORR of 27% (95% CI: 19-36)
  - Only 12% of patients had a duration of response  $\geq 14$  weeks
  - Duration of response  $\leq 14$  weeks in 55% of responders
- Responses adjudicated in 52% of the responders
- Inherent problems with single arm studies

# Key Regulatory History Milestones

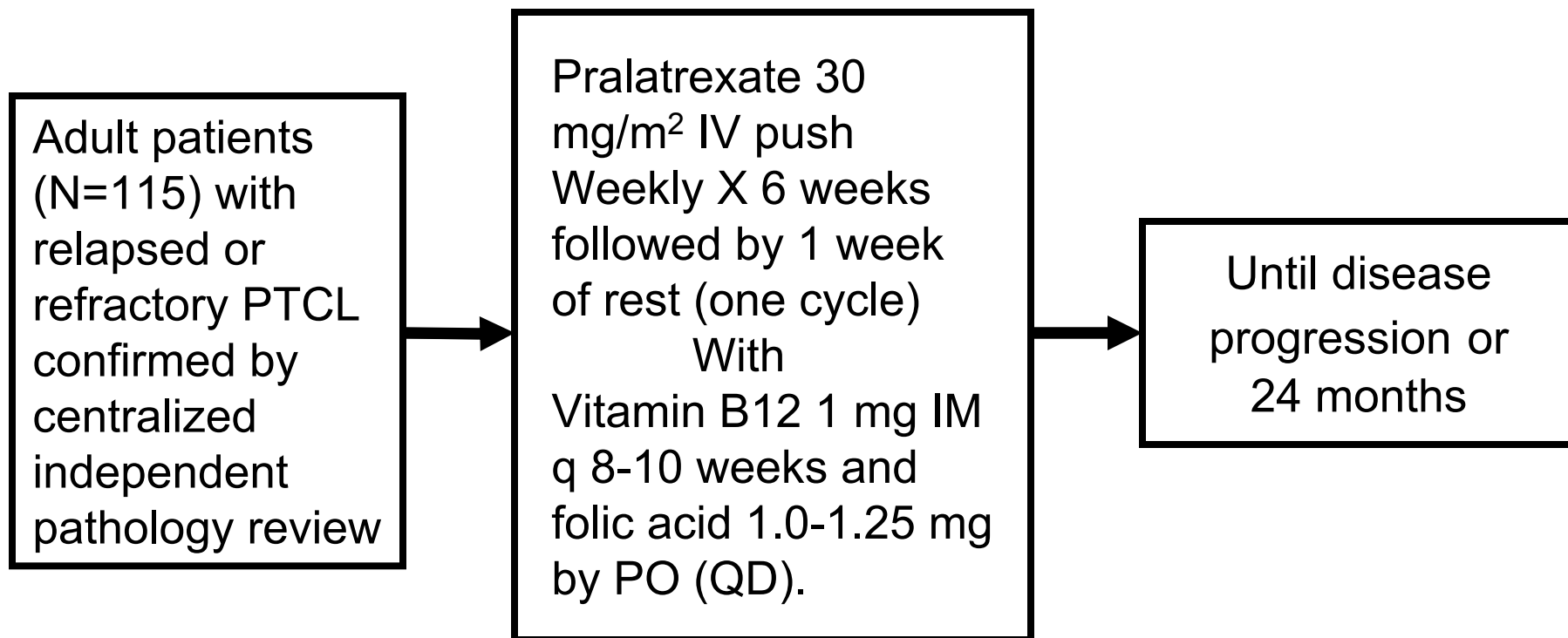
- February 6, 2006: End of Phase I/II meeting
- July 20, 2006: Orphan-product designation
- Sept 28, 2006: Fast track designation
- July 28, 2006: Special Protocol Assessment (SPA)



# SPA Agreement

FDA agreed that the primary endpoint of ORR is acceptable; however, the magnitude and duration of response for approval would be a review issue.

# PDX-008 Trial Design



## **PDX-008 Key Eligibility Criteria**

- Histologically/cytologically confirmed PTCL by central pathological review
- Clear documented progressive disease after at least 1 prior treatment
- At least 1 biopsy from the initial diagnosis or in the relapsed setting to confirm the diagnosis of PTCL

# PDX-008 Key Eligibility Criteria

- No restriction on maximum number of prior therapies
- ECOG PS 0 – 2
- Adequate hematological, hepatic, and renal function
  - Platelets  $\geq 100,000/\mu\text{L}$
  - ANC  $\geq 1,000/\mu\text{L}$
  - Bilirubin  $\leq 1.5 \text{ mg/dL}$
  - ALT/AST  $\leq 2.5 \times \text{ULN}$
  - Creatinine  $\leq 1.5 \text{ mg/dL}$

# Eligible Histological Subtypes

- T/Natural killer (NK) cell leukemia/lymphoma
- Adult T-cell leukemia/lymphoma (human T-cell leukemia virus [HTLV] 1+)
- Angioimmunoblastic T-cell lymphoma
- Blastic NK lymphoma (with skin, lymph node, or visceral involvement)
- Anaplastic large cell lymphoma, primary systemic type
- PTCL – unspecified
- T/NK-cell lymphoma – nasal
- Enteropathy-type intestinal lymphoma
- Hepatosplenic T-cell lymphoma
- Extranodal peripheral T/NK-cell lymphoma – unspecified
- Subcutaneous panniculitis T-cell lymphoma
- Transformed mycosis fungoides

# Endpoints

- **Primary Endpoint:**
  - Response rate (CR + CRu + PR) according to IWC assessed by independent central review
- **Secondary Endpoints:**
  - Duration of response
  - Progression-free survival
  - Overall survival

# According to IWC

- No requirement for confirmatory scans for response

## **Report of an International Workshop to Standardize Response Criteria for Non-Hodgkin's Lymphomas**

/ Bruce D. Cheson, Sandra J. Horning, Bertrand Coiffier, Margaret A. Shipp, Richard I. Fisher, Joseph M. Connors,

**J Clin Oncol 17:1244-1253, 1999**

## IWC Response Criteria for NHL

Response Category	Physical Examination	Lymph Nodes	Lymph Node Masses	Bone Marrow
CR	Normal	Normal	Normal	Normal
CRu	Normal	Normal	Normal	Indeterminate
	Normal	Normal	> 75% decrease	Normal or indeterminate
PR	Normal	Normal	Normal	Positive
	Normal	≥ 50% decrease	≥ 50% decrease	Irrelevant
	Decrease in liver/spleen	≥ 50% decrease	≥ 50% decrease	Irrelevant
Relapse/progression	Enlarging liver/spleen; new sites	New or increased	New or increased	Reappearance



“**Response rates** do not necessarily influence other measures of overall clinical benefit or outcome in patients with lymphoma. **Durable complete responses**, if associated with measures of clinical benefit, may be relevant.”

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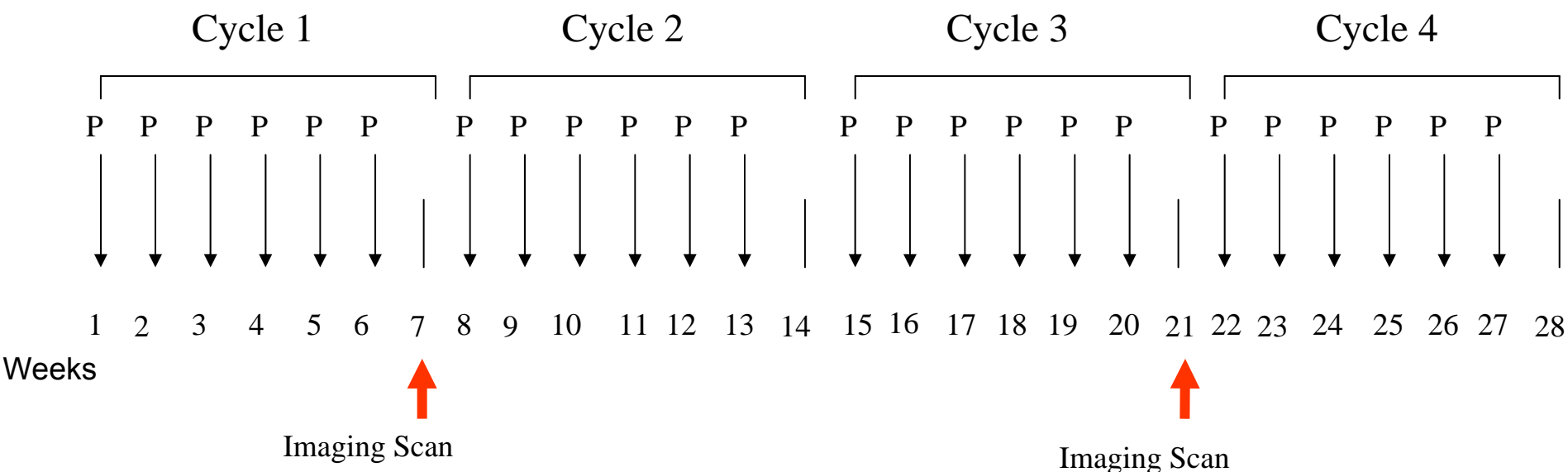
JOURNAL OF CLINICAL ONCOLOGY

SPECIAL ARTICLE

# Primary Endpoint Evaluations

- Clinical evaluation
- Bone marrow biopsy
- Imaging modality
  - CT or MRI
  - Medical photography with ruler measurement of cutaneous lesions
  - PET scans

# Treatment Schedule and Evaluation Schema



- Cycles repeat until disease progression or condition met as described in section 6.3
- After cycle 1, scans every 14 weeks just prior to the first dose of an even cycle
- P = pralatrexate

# PDX-008 Results

# Patient Population

## 115 Patients enrolled

- 80 (69%) US
- 26 (23%) Europe
- 9 (8%) Canada
- Safety analyses on 111 patients
  - 4 patients did not receive pralatrexate
- Efficacy analyses on 109 evaluable patients
  - 2 treated patients did not have eligible histology per central pathology review

# Central Pathology Confirmation

- 109 evaluable patients
- 86/115 (77%) from previous tissue blocks
- 25/115 (22%) from tumor re-biopsy
- 3/109 (3%) needed clinical assessment by the PI to help make pathological diagnosis after retrospective review of patient records

# Patient Characteristics

Category	Parameter	Pralatrexate Treated (N = 111)	
		N	Percent
Gender	M	76	68
	F	35	32
Race	White	80	72
Age (years)	≤ 65	71	64
	≥ 65	40	36
ECOG PS	0	43	39
	1	49	44
	2	19	17

# Histology

Histopathology	Per Independent Central Review (N = 111)	
	N	Percent
PTCL-unspecified	59	53
Anaplastic large cell lymphoma, primary systemic	17	15
Angioimmunoblastic T-cell lymphoma	13	12
Transformed mycosis fungoides	12	11
Blastic NK lymphoma (with skin, lymph node, or visceral involvement)*	4	4
T/NK-cell lymphoma-nasal*	2	2
Extranodal peripheral T/NK-cell lymphoma unspecified*	1	< 1
Adult T-cell leukemia/lymphoma (HTLV 1+)	1	< 1
Mycosis fungoides (not transformed)	1	< 1
Inconsistent with T-cell lymphoma	1	< 1



# Prior Therapies

Prior Regimen	N	Percent
1	23	21
2	30	27
3	23	21
4	14	13
≥5	21	19
Median (range)	3.0 (1-12)	

# **PDX-008 Efficacy Results**

# Main Concerns with this NDA

- Duration of response
  - ORR of 27% (95% CI: 19-36)
  - Only 12% of patients had a duration of response  $\geq 14$  weeks
  - Duration of response  $\leq 14$  weeks in 55% of responders
- Responses adjudicated in 52% of the responders
- Inherent problems with single arm studies

# PDX-008 Efficacy Results

	Central Review N = 109
<b>CR+CRu+PR</b> <b>95% CI</b>	<b>29 (27%)</b> <b>19-36%</b>
<b>CR</b>	<b>7 (6%)</b>
<b>CRu</b>	<b>2 (2%)</b>
<b>PR</b>	<b>20 (18%)</b>

# FDA Analysis of PDX-008 Trial Data

- After review of the data submitted, the FDA agrees that 29/109 evaluable patients had a response seen on a scan.
- Only 13/29 of these responders maintained duration of that response for  $\geq 14$  weeks (time interval between scans).

# FDA Analysis of PDX-008 Response Results

	<b>N=109</b>	<b>%</b>
<b>Responses <math>\geq</math> 14 weeks CR+CRu+PR 95 % CI</b>	<b>13</b>	<b>12</b>  <b>7-20</b>
<b>CR</b>	<b>6</b>	<b>6</b>
<b>CRu</b>	<b>1</b>	<b>1</b>
<b>PR</b>	<b>6</b>	<b>6</b>

## Duration of Response

Patients were designated as responders when their nodal shrinkage met the IWC criteria on a given scan.

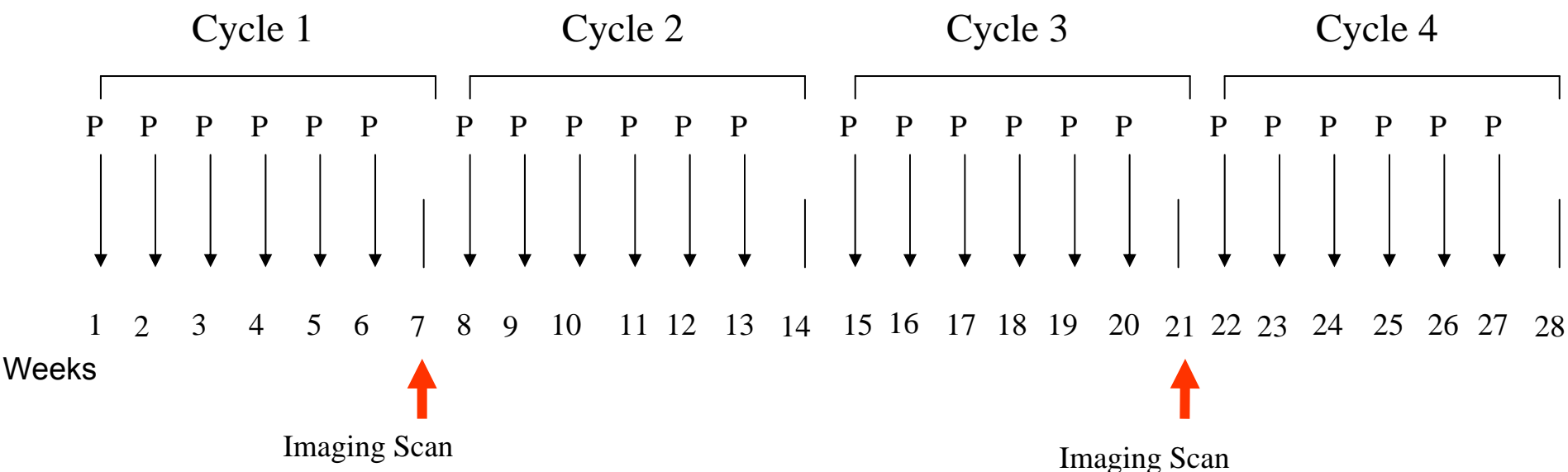
# Response Evaluations

Tumor status of all patients enrolled was evaluated by imaging scans. Target lesions at baseline were:

- 1 (1%) Cutaneous only
- 92 (84%) Radiology only
- 15 (14%) Both

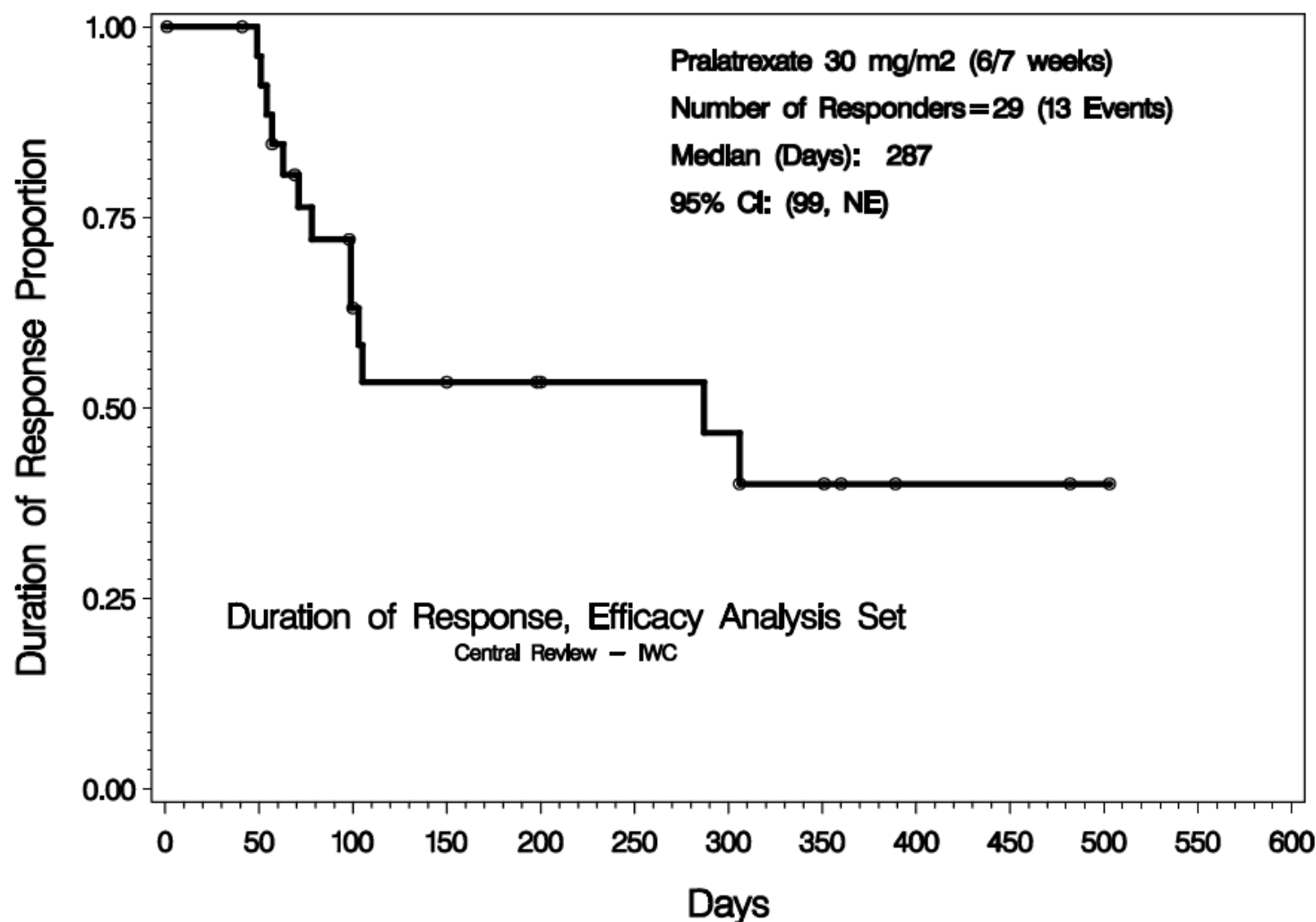


# Evaluation Schema

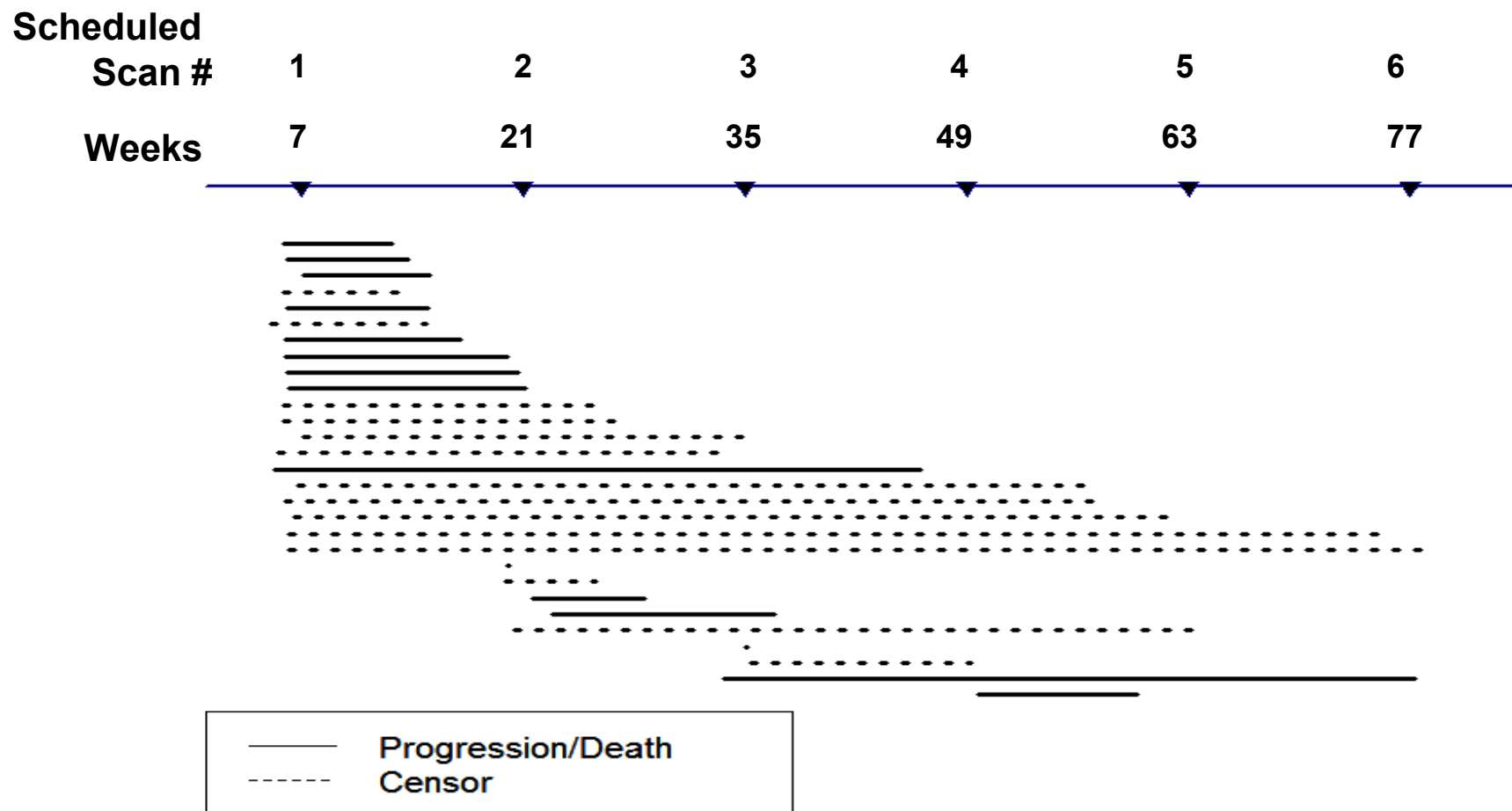


- Cycles repeat until disease progression or condition met as described in section 6.3
- After cycle 1, scans every 14 weeks just prior to the first dose of an even cycle
- P = pralatrexate

# Applicant's Kaplan-Meier Estimate of Duration of Response



# Analysis of Duration of Response for Individual Responders



# Duration of Response

16/29 (55%) responders had a duration of response that was less than 14 weeks (time between 2 consecutive scans).

- 10/16 responders did not maintain response on subsequent scan.
- 3/16 responders had no subsequent imaging scans due to off-study treatment
  - 2 went off due to consent withdrawal and
  - 1 due to SAE that resulted in death.
- 3/16 responders were censored
  - 2 because of BMT and
  - 1 at the study cut off date.

# High Adjudication Rate for Responders

Responses in 15 of 29 (52%) responders were adjudicated due to the disagreement between central reader 1 and 2 of the independent imaging review committee.

# Confounding Factors Affecting Response

- Radiation to only site of disease prior to study enrollment
- Waxing and waning of nodes without any treatment in lymphomas
- Medications (anti-inflammatory and or corticosteroids)
- Infections and inflammations

# FDA Analysis of PDX-008 Response Results

	<b>N=109</b>	<b>%</b>
<b>Responses <math>\geq</math> 14 weeks CR+CRu+PR 95 % CI</b>	<b>13</b>	<b>12</b>  <b>7-20</b>
<b>CR</b>	<b>6</b>	<b>6</b>
<b>CRu</b>	<b>1</b>	<b>1</b>
<b>PR</b>	<b>6</b>	<b>6</b>

# Summary of 6 CRs and 1 CRu with DOR $\geq$ 14 Weeks

	Previous Therapy	Histological Subtype	Response to Pralatrexate Adjudicated
<b>CR 6</b>	3 pts $\geq$ 3 2 pts $\geq$ 2 1 pt $\geq$ 1	2 pts: ALCL 1 pt: T/NK cell 3 pts: PTCL (NOS)	CR in 5 of 6 patients were adjudicated
<b>CRu 1</b>	4	PTCL (NOS)	Yes



## Summary of Efficacy

- Duration of response < 14 weeks in 55% of responders
- High adjudication rate (52%) and confounding factors

# Subsequent Therapy for PTCL after Pralatrexate Treatment

	Subsequent Therapy	Efficacy Analysis Set (N=109) n (%)
Initial Subsequent Treatment for PTCL	Non platinum-containing multi-agent chemotherapy	19 (17)
	Platinum-containing multi-agent chemotherapy	14 (13)
	Single-agent chemotherapy	14 (13)
	Systemic investigational agents	8 (7)
	Radiation therapy with or without systemic treatment	4 (4)
	Steroids alone	4 (4)
	CHOP	2 (2)
	Other	2 (2)
	Bexarotene	1 (<1)
	Denileukin diftitox	1 (<1)
Subsequent Stem Cell Transplant at Any Time		13 (12)

# Safety

Safety assessments were performed on 111 enrolled patients who had received at least one dose of pralatrexate.

- Adverse Events (AEs)
- Serious Adverse Events (SAEs)
- Death

# AEs

- All patients on the trial reported at least 1 AE that was thought to be drug related.
- Mucositis and thrombocytopenia were the commonest AEs.
- AEs were the reason for
  - Dose reductions: 31%
  - Dose omission: 69%
  - Treatment withdrawal: 23%

# AEs Occurring in $\geq 20\%$ of Patients (N = 111)

Adverse Event	Grade 1	Grade 2	Grade 3	Grade 4	Total
<b>Mucosal inflammation</b>	<b>20%</b>	<b>30%</b>	<b>17%</b>	<b>4%</b>	<b>70%</b>
<b>Thrombocytopenia</b>	<b>1%</b>	<b>7%</b>	<b>14%</b>	<b>19%</b>	<b>41%</b>
<b>Nausea</b>	<b>24%</b>	<b>12%</b>	<b>4%</b>	<b>--</b>	<b>40%</b>
<b>Fatigue</b>	<b>19%</b>	<b>11%</b>	<b>5%</b>	<b>2%</b>	<b>36%</b>
Anemia	4%	14%	15%	2%	34%
Constipation	24%	9%	--	--	33%
Pyrexia	23%	8%	1%	1%	32%
Edema	18%	11%	1%	--	30%
Cough	23%	4%	1%	--	28%
Epistaxis	24%	2%	--	--	26%
Vomiting	16%	7%	2%	--	25%
<b>Neutropenia</b>	<b>--</b>	<b>5%</b>	<b>13%</b>	<b>7%</b>	<b>25%</b>
Diarrhea	13%	6%	2%	--	21%

## Grade 3 and 4 AEs

Adverse Event	Grade 3/4
Mucosal inflammation	21%
Thrombocytopenia	33%
Neutropenia	20%

# Serious Adverse Events

The total number of SAEs reported are 107 in 49 patients.

The SAEs reported for > 3 patients included

■ Pyrexia	8
■ Mucosal Inflammation	6
■ Febrile Neutropenia	5
■ Sepsis	5
■ Thrombocytopenia	3

## Early Deaths

8 deaths within 30 days of their last dose of pralatrexate

- 7 were attributed to PD
- 1 to cardiopulmonary arrest (possibly related to pralatrexate)



# Reasons for Treatment Discontinuation

<b>Patients who discontinued study treatment</b>	<b>102 (92%)</b>
<b>Reason for discontinuing study treatment</b>	
<b>Disease Progression</b>	<b>64 (58%)</b>
<b>Adverse Event</b>	<b>25 (23%)</b>
<b>Investigator Decision</b>	<b>7 (6%)</b>
<b>Patient Decision</b>	<b>5 (5%)</b>
<b>Other</b>	<b>1 (&lt; 1%)</b>

# Drug Exposure

- 45/109 (41%) Off before cycle 2 or 8 weeks
- 85/109 (78%) Off before cycle 4 or 21 weeks  
(64% due to PD)

# Conclusion of PDX-008 trial

- ORR of 27% (95% CI: 19-36)
  - 7 CR and 2 CRu
- Only 12% of patients had a duration of response  $\geq$  14 weeks.
  - 6 CR and 1 CRu (2 ALCL, 1 NK cell lymphoma and 4 with PTCL-NOS)
  - Duration of response < 14 weeks in 55% of responders
- High adjudication rate (52%) and confounding factors
- 70% of patients received subsequent therapies after pralatrexate
- Most common Grade 3 and 4 toxicities were thrombocytopenia, mucositis and neutropenia.

# ODAC Question (Voting)

**This NDA submission is based on an overall response rate from a single arm trial using pralatrexate as a single agent in the treatment of 109 patients with relapsed or refractory PTCL. Tumor status was assessed by imaging scans performed at week 7 after initiation of pralatrexate treatment and subsequently every 14 weeks. The responses were evaluated by an independent imaging review committee (IRC).**

- **The applicant reported an overall response rate of 27% (95% CI: 19-36%) according to the International Workshop Criteria (IWC) for malignant lymphoma.**
- **Response determination was adjudicated in 52% of responders because of the disagreement between central readers 1 and 2 of the IRC.**
- **Due to the absence of confirmatory scans for responders after initial response designation according to IWC, the duration of response (DOR) in 55% of responders was found to be < 14 weeks. Only 12% of 109 evaluable patients (13 responders) had a DOR ≥ 14 weeks. Nine of these 13 responders (69%) had their response determination adjudicated.**
- **Seventy percent of patients received subsequent therapies after pralatrexate treatment.**
- **The most common grade 3 and 4 toxicities were thrombocytopenia, mucositis and neutropenia.**
- **The applicant has no on-going phase 3 clinical trials for pralatrexate in any indication.**

## Question to ODAC

**VOTE:** As noted above, the Applicant has provided a single arm trial with an overall response rate of 27%. The majority of these responses were partial responses (18%) and only 8% were CR or CRu. The duration of response was less than 14 weeks in 55% of responders. **Are the response rate and duration of response results "reasonably likely" to predict for clinical benefit?** Clinical benefit in lymphomas would be defined as an improvement in overall survival or a robust effect on progression-free survival. Please discuss in your answer the importance of partial responses in predicting clinical benefit as defined above.

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# BACKUP – SLIDE

# FDA's Evaluation of Responses

Pt #	Status	Best Response	Status	Type	Duration(days)
26	Off	PR	Event	PD	<u>306</u>
64	Off	PR	Event	PD	<u>287</u>
59	Off	CR	Censored	Transplant	<u>150</u>
67	Off	CR	Censored	Transplant	<u>100</u>
49	Off	PR	Censored	Transplant	69
10	Off	CR	Censored	Transplant	41
29	Off	CR	Censored	Other Therapy	<u>306</u>
92	Off	PR	Censored	Study Term	57
35	On	CRu	Censored	Continuing	<u>503</u>
36	On	CR	Censored	Continuing	<u>482</u>
57	On	PR	Censored	Continuing	<u>389</u>
52	On	CR	Censored	Continuing	<u>360</u>
41	Off	CR	Censored	Continuing	<u>351</u>
113	On	PR	Censored	Continuing	<u>200</u>
105	On	PR	Censored	Continuing	<u>198</u>
86	On	PR	Censored	Continuing	<u>98</u>